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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application: Figiel et al.	)	Group Art Unit: 1711
	)	
Serial No. 10/039,987	)	Examiner: Tran, Thao T.
	)	
Filed: January 4, 2002	)	Atty. Docket No. 1994.CRG
	)	
For: ADHESIVE COMPOSITION		

**BRIEF ON APPEAL**

Commissioner for Patents  
Alexandria, VA 22313-1450

Sir:

Applicants hereby appeal the decision of the Primary Examiner finally rejecting claims 1 and 3-20, all pending claims. A timely Notice of Appeal was filed on June 7, 2004. A three month extension of time, extending the period for filing this brief until November 8, 2004 (November 7 being a Sunday), is being concurrently filed herewith

This Brief is being filed in triplicate. The fee, as required under 37 C.F.R. § 1.17(c), accompanies the filing of this Brief (fee transmittal form attached).

A copy of the claims involved in this appeal is set forth in the Appendix.

I. Real party in interest

The real party in interest, as evidenced by the assignment document recorded January 4, 2002 (Reel 012509, Frame 0648), is National Starch and Chemical Investment Holding Corporation.

II. Related appeals and interferences

There are no other appeals or interferences known to applicants which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

### III. Status of claims

Claims 1 and 3-20 are pending and have been finally rejected.

Claims 1 and 3-15 are rejected under 35 U.S.C § 102 (e) as being anticipated by Figiel et al. (U.S. Patent No. 6,387,475).

Claims 1, 3, 4, 7, 9, 10, 14, 15 and 19 are rejected under 35 U.S.C § 102 (e) as being anticipated by Eden et al. (U.S. Patent No. 6,379,447).

Claims 1, 3-5, 7, 9, 10, and 12-20 are rejected under 35 U.S.C § 102 (e) as being anticipated by Lydzinski et al. (U.S. Patent No. 6,280,515).

Claims 6 and 8 are rejected under 35 U.S.C § 103 as being unpatentable over Lydzinski et al. (U.S. Patent No. 6,280,515).

Claims 1, 3, 9, 10, 14, 15 and 19 are rejected under 35 U.S.C § 102 (b) as being anticipated by Nguyen et al. (U.S. Patent No. 5,716,441).

### IV. Status of amendments

The amendment filed June 7, 2004 is to be entered upon the filing of this brief.

### V. Summary of invention

Applicants have discovered that the addition of an organic anhydride to an adhesive composition improves the drying speed of the adhesive formulation, especially when added to waterborne compositions.

Claimed subject matter is directed to an adhesive comprising an organic anhydride component in an amount effective to improve the set speed of the adhesive. Preferred organic anhydrides for use in the practice of the invention are alkenyl succinic anhydrides, most preferably octenyl succinic anhydride (OSA) and dodecenyl succinic anhydride (DDSA). The adhesive preferably also contains a cross-linking agent.

In one embodiment, the organic anhydride component used in the adhesive is part of a cross-linked carrier starch. In another embodiment, the organic anhydride component used in the adhesive is not used as part of a cross-linked carrier starch. See page 4, lines 1-3.

In a particularly preferred embodiment, the adhesive is a polymer resin emulsion-based adhesive such as a polyvinyl alcohol stabilized ethylene vinyl acetate resin emulsion.

Also claimed is a method of increasing the set speed of an adhesive comprising adding to the adhesive an organic anhydride component in an amount effective to improve the set speed of the adhesive.

Articles of manufacture comprising the adhesive and method bonding substrates together using the adhesive are additional embodiments of the invention

## VI. Issues

A. WHETHER THE EXAMINER ERRED DETERMINING THAT THE SUBJECT MATTER OF CLAIM 1 and 3-15 ARE ANTICIPATED BY FIGEL ET AL. (U.S. PATENT NO. 6,387,475).

B. WHETHER THE EXAMINER ERRED IN DETERMINING THAT THE SUBJECT MATTER OF CLAIMS 1, 3, 4, 7, 9, 10, 14, 15 and 19 ARE ANTICIPATED BY EDEN ET AL (U.S. PATENT NO. 6,379,447).

C. WHETHER THE EXAMINER ERRED IN DETERMINING THAT THE SUBJECT MATTER OF CLAIMS 1, 3-5, 7, 9, 10, and 12-20 ARE ANTICIPATED BY LYDZINSKI ET AL. (U.S. PATENT NO. 6,280,5155).

D. WHETHER THE EXAMINER ERRED IN DETERMINING THAT THE SUBJECT MATTER OF CLAIMS 1, 3, 9, 10, 14, 15 and 19 ARE ANTICIPATED BY NGUYEN ET AL. (U.S. PATENT NO. 5,716,441).

## VII. Grouping of claims

The patentability of claims 1, 3, 9 and 10 are to be separately determined.

All other claims are to stand or fall with the claim on which it is dependent.

## VIII. Arguments

A. The examiner erred in determining that claims 1 and 3-15 are anticipated by Figiel et al. (U.S. Patent No. 6,387,475).

Claims 1 and 3-15 are rejected under 35 U.S.C § 102 (e) as being anticipated by Figiel et al. (U.S. Patent No. 6,387,475).

Figiel is cited as teaching an adhesive composition comprising crosslinked starch modified by 3% by weight of octenyl succinic anhydride, ethylene vinyl acetate, polyvinyl alcohol, crosslinking agent such as polyvalent salt activator, and used in various applications such as making coreless paper rolls. The examiner acknowledges that Figiel is silent with

respect to improving set speed, but urges the composition would inherently have the same properties as those claimed.

#### Claims 1 and 3

Applicants' claims 1 and 3 are directed to a waterborne adhesive having improved set speed. A required component of the adhesive is an alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch, must be used in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides adhesives offering faster set speeds that disperse water in the film forming stage, allowing for improved drying rates.

Figiel discloses use of a dicarboxylic acid anhydride starch derivative, which may be an OSA-modified starch derivative as a release agent in the formation of waterbased adhesive. This document fails to disclose or even suggest the use of OSA alone (as specifically required in claim 3), or as part of a crosslinked carrier starch, as a component of a waterborne adhesive, in an amount needed to improve the set speed of the adhesive.

Applicants submit that claims 1 and 3, and claims dependent thereon, are patentable over the Figiel disclosure.

#### Claims 9 and 10

Applicants' claims 9 and 10 are directed to methods of improving the set speed of waterborne adhesives by adding to the adhesive alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch, must be added in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides for faster set speeds.

Figiel discloses use of a dicarboxylic acid anhydride starch derivative, which may be an OSA-modified starch derivative as a release agent in the formation of waterbased adhesive. This document fails to disclose or even suggest the use of OSA alone (as specifically required in claim 10), or as part of a crosslinked carrier starch, in an amount needed to improve the set speed of the adhesive. Figiel is completely silent as to any method to increasing set speed as claimed by applicants.

Applicants submit that claims 9 and 10, and claims dependent thereon, are patentable over the Figel disclosure.

B. The examiner erred in determining that claims 1, 3, 4, 7, 9, 10, 14, 15 and 19 are anticipated by Eden et al. (U.S. Patent No. 6,379,447).

Claims 1, 3, 4, 7, 9, 10, 14, 15 and 19 are rejected under 35 U.S.C § 102 (e) as being anticipated by Eden et al. (U.S. Patent No. 6,379,447).

Eden is cited as teaching an adhesive composition comprising crosslinked starch modified by 5% by weight of octenyl succinic anhydride and a crosslinking agent (the examiner referring to col. 8, lines 47-52 and to claims 1, 6 and 7), and used in various applications such as paper laminating. The examiner acknowledges that Eden is silent with respect to improving set speed, but urges the composition would inherently have the same properties as those claimed.

#### Claims 1 and 3

Applicants' claims 1 and 3 are directed to a waterborne adhesive having improved set speed. A required component of the adhesive is an alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch, must be used in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides adhesives offering faster set speeds that disperse water in the film forming stage, allowing for improved drying rates.

Eden discloses polysaccharide adhesives comprising 15 to 50 wt % of a polysaccharide material (e.g., starch, dextrans and blends thereof) and having specific characteristics (e.g., zero-shear viscosities and shear thinning index) as a continuous aqueous phase and, if desired, in addition to the aforementioned continuous aqueous phase, an insoluble polysaccharide particulate phase. The particulate phase may be a crosslinked starch, thermally treated starch or a gum. The disclosure noted by the examiner at col. 7, relates to the use of 5 parts of a waxy OSA treated enzyme converted multidextrin as a component of the continuous phase in a composition that did not have the required characteristics and did not perform well. This document fails to disclose or even suggest the use of OSA alone (as specifically required in claim 3), or as part of a

crosslinked carrier starch, as a component of a waterborne adhesive, in an amount needed to improve the set speed of the adhesive.

Applicants submit that claims 1 and 3, and claims dependent thereon, are patentable over the Eden disclosure.

Claims 9 and 10

Applicants' claims 9 and 10 are directed to methods of improving the set speed of waterborne adhesives by adding to the adhesive alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch that must be added in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides for faster set speeds.

The Eden disclosure fails to disclose or even suggest the use of OSA alone (as specifically required in claim 10), or as part of a crosslinked carrier starch, in an amount needed to improve the set speed of the adhesive. Eden is completely silent as to any method to increasing set speed as claimed by applicants.

Applicants submit that claims 9 and 10, and claims dependent thereon, are patentable over the Eden disclosure.

C. The examiner erred in determining that claims 1, 3-5, 7, 9, 10, and 12-20 are anticipated by Lydzinski et al. (U.S. Patent No. 6,280,515).<sup>\*</sup>

Claims 1, 3-5, 7, 9, 10, and 12-20 are rejected under 35 U.S.C § 102 (e) as being anticipated by Lydzinski et al. (U.S. Patent No. 6,280,515). Lydzinski is cited as teaching an adhesive composition comprising a polysaccharide, such as a crosslinked starch modified with 3% by weight of an organic anhydride such as octenyl succinic anhydride, polyvinyl alcohol, a crosslinking agent such as calcium chloride, and used in various applications such as paper laminating wood bonding and tissue and towel manufacture. The examiner acknowledges that Lydzinski is silent with respect to

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<sup>\*</sup> Claims 6 and 8 were rejected as being obvious over Lydzinski. As claims 6 and 8 are to stand or fail with claim 3, this rejection has not been addressed. Nevertheless, it is maintained the disclosure at col. 1, lines 23-29, acknowledging that foamed EVA-based adhesives are known in the art, in view of the teachings of Lydzinski, would not suggest addition of EVA to the adhesive polysaccharide adhesives of Lydzinski and certainly would not suggest addition of OSA or an OSA-modified starch as a component in an EVA-based adhesive.

improving set speed, but urges the composition would inherently have the same properties as those claimed.

#### Claims 1 and 3

Applicants' claims 1 and 3 are directed to a waterborne adhesive having improved set speed. A required component of the adhesive is an alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch that must be used in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides adhesives offering faster set speeds that disperse water in the film forming stage, allowing for improved drying rates.

Lydzinski discloses foamable adhesives comprising a polysaccharide modified with, for example OSA, and water. The modified polysaccharide facilitates foaming. This document fails to disclose or even suggest the use of OSA alone, or as part of a crosslinked carrier starch, as a component of a waterborne adhesive, in an amount needed to improve the set speed of the adhesive.

This document fails to disclose or even suggest the use of OSA alone (as specifically required in claim 3), or as part of a crosslinked carrier starch, as a component of a waterborne adhesive, in an amount needed to improve the set speed of the adhesive. This disclosure fails to teach or even suggest the adhesive composition claimed by applicants and furthermore, provides no disclosure that would motivate the skilled artisan to use an alkenyl succinic anhydride component, let alone in amounts needed to improve set speed.

Applicants submit that claims 1 and 3, and claims dependent thereon, are patentable over the Lydzinski disclosure.

#### Claims 9 and 10

Applicants' claims 9 and 10 are directed to methods of improving the set speed of waterborne adhesives by adding to the adhesive alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch that must be added in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides for faster set speeds.

The Lydzinski disclosure fails to disclose or even suggest the use of OSA alone (as specifically required in claim 10), or as part of a crosslinked carrier starch, in an amount needed to improve the set speed of the adhesive. Lydzinski is completely silent as to any method to increasing set speed as claimed by applicants.

Applicants submit that claims 9 and 10, and claims dependent thereon, are patentable over the Lydzinski disclosure.

D. The examiner erred in determining that claims 1, 3, 9, 10, 14, 15 and 19 are anticipated by Nguyen et al. (U.S. Patent No. 5,716,441).

Claims 1, 3, 9, 10, 14, 15 and 19 are rejected under 35 U.S.C § 102 (b) as being anticipated by Nguyen et al. (U.S. Patent No. 5,716,441).

Nguyen is cited as teaching an adhesive composition comprising a starch modified by 3% by weight of octenyl succinic anhydride and a crosslinking agent, and used in various applications such as paper bonding and case and carton. The examiner acknowledges that Nguyen is silent with respect to improving set speed, but urges the composition would inherently have the same properties as those claimed.

Claims 1 and 3

Applicants' claims 1 and 3 are directed to a waterborne adhesive having improved set speed. A required component of the adhesive is an alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch that must be used in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides adhesives offering faster set speeds that disperse water in the film forming stage, allowing for improved drying rates.

Nguyen discloses starch-based adhesives. The starch used in the practice of the Nguyen is a hydrophobically modified fluidity corn starch prepared by reacting a base corn starch that has been converted to a water fluidity of from about 60 to about 80 with an organic acid anhydride reagent, such as octenyl succinic anhydride. This document fails to disclose or even suggest the use of OSA alone (as specifically required in claim 3), or as part of a crosslinked carrier starch, as a component of a waterborne adhesive, in an amount needed to improve the set speed of the adhesive. This disclosure fails to teach



or even suggest the adhesive composition claimed by applicants and furthermore, provides no disclosure that would motivate the skilled artisan to use an alkenyl succinic anhydride component, let alone in amounts needed to improve set speed.

Applicants submit that claims 1 and 3, and claims dependent thereon, are patentable over the Nguyen disclosure.

#### Claims 9 and 10

Applicants' claims 9 and 10 are directed to methods of improving the set speed of waterborne adhesives by adding to the adhesive alkenyl succinic anhydride component such as an octenyl succinic anhydride (OSA) component. This component, e.g., OSA or an OSA crosslinked starch that must be added in amounts sufficient to have the desired effect, i.e., amounts sufficient to increase the set speed. Use of this component provides for faster set speeds.

The Nguyen disclosure fails to disclose or even suggest the use of OSA alone (as specifically required in claim 10), or as part of a crosslinked carrier starch, in an amount needed to improve the set speed of the adhesive. Nguyen is completely silent as to any method to increasing set speed as claimed by applicants.

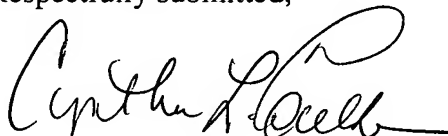
Applicants submit that claims 9 and 10, and claims dependent thereon, are patentable over the Nguyen disclosure.

### Conclusion

None of the cited Figiel, Eden, Lydzinski, or Nguyen patents teach waterborne adhesive containing OSA component (OSA or OSA carrier starch comprising OSA) in the adhesive compositions claimed by applicants. Use of an OSA component in waterborne adhesive compositions in amounts sufficient to improve set speed is not anticipated by any of the Figiel, Eden, Lydzinski, or Nguyen patents references.

Applicants submit that the claim subject matter is patentable over the prior art applied by the examiner. The rejection of record cannot be sustained and the Board is requested to reverse the examiner's rejection.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Cynthia L. Foulke', with a stylized flourish at the end.

Cynthia L. Foulke  
Reg. No. 32,364

November 8, 2004

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## APPENDIX

1. A waterborne adhesive comprising an alkenyl succinic anhydride component in an amount effective to improve the set speed of the adhesive.
3. The adhesive of claim 1 wherein the alkenyl succinic anhydride component is octenyl succinic anhydride, wherein said octenyl succinic anhydride when added to the adhesive is not part of a crosslinked octenyl succinic anhydride-modified starch.
4. The adhesive of claim 3 wherein the adhesive has been crosslinked.
5. The adhesive of claim 1 wherein the alkenyl succinic anhydride component comprises a crosslinked carrier starch containing octenyl succinic anhydride groups.
6. The adhesive of claim 16 comprising ethylene vinyl acetate.
7. The adhesive of claim 3 which is a starch based adhesive.
8. The adhesive of claim 6 further comprising polyvinyl alcohol.
9. A method of increasing the set speed of a waterborne adhesive comprising adding to a waterborne adhesive an alkenyl succinic anhydride component in an amount effective to improve the set speed of the adhesive.
10. The method of claim 9 wherein the alkenyl succinic anhydride component is octenyl succinic anhydride, wherein said octenyl succinic anhydride added to the adhesive is not part of a crosslinked octenyl succinic anhydride-modified starch.
11. The method of claim 10 further comprising adding a crosslinking agent.

12. The method of claim 9 wherein the alkenyl succinic anhydride component comprises a crosslinked carrier starch containing octenyl succinic anhydride groups.
13. An article of manufacture comprising the adhesive of claim 5.
14. An article of manufacture comprising the adhesive of claim 3.
15. A method for bonding materials together which comprises applying the adhesive composition of claim 1 to a first substrate, bringing a second substrate in contact with the adhesive composition applied to the first substrate, and subjecting the applied composition to conditions which will allow the composition to form a set bond.
16. The adhesive of claim 3 which is a polymer resin emulsion based adhesive.
17. The method of claim 10 wherein said octenyl succinic anhydride is added to a polymer resin emulsion based adhesive.
18. The method of claim 12 wherein said alkenyl succinic anhydride component is added to a polymer resin emulsion based adhesive.
19. The method of claim 15 wherein the alkenyl succinic anhydride component is octenyl succinic anhydride, wherein said octenyl succinic anhydride when added to the adhesive is not part of a crosslinked octenyl succinic anhydride-modified starch.
20. The method of claim 15 wherein the alkenyl succinic anhydride component comprises a crosslinked carrier starch containing octenyl succinic anhydride groups.